In re Application of RAJARAJAN et al.
Serial No. 09/742,781

REMARKS

Claims 1-29 are now pending in this application. The Office action rejected claims 1-3, 6-10, 13-25, 27, and 29 under 35 U.S.C. §102(a) as being anticipated by U.S. Patent No. 5,956,023 to Lyle et al. ("Lyle"). Additionally, claims 4-5 and 26 were apparently also rejected under 35 U.S.C. §102(a) since the Office action contends so under the same heading. Furthermore, claim 28 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lyle in view of U.S. Patent No. 6,418,421 to Hurtado et al. ("Hurtado") and claims 11-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lyle in view of U.S. Patent No. 6,515,656 to Wittenberg et al. ("Wittenberg"). Applicants respectfully disagree.

By present amendment, claims 1, 14, and 19 have been amended for clarification and not in view of the prior art. Applicants submit that the claims as filed were patentable over the prior art of record, and that the amendments herein are for purposes of clarifying the claims and/or for expediting allowance of the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Applicants thank the Examiner for the interview held (by telephone) on July 1, 2004. During the interview, the Examiner and applicants' attorney discussed the claims with respect to the prior art. The essence of applicants' position is incorporated in the remarks below.

Prior to discussing reasons why applicants believe that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

The present invention is directed to a method and system for interacting with a modeling layout algorithm in a computing environment having two engines. More specifically, a modeling engine and a layout engine work in conjunction with each other to facilitate the emulation of electronic modeling elements in an electronic system design. An engine is term widely recognized in the art and a generally accepted definition, as defined by the Microsoft Press Computer Dictionary, is as follows: a back-end processor or portion of a program that determines how the program manages and manipulates data. The term engine is most often used in relation to a specific program; for example, a database engine contains the tools for manipulating a database.

As such, the method and system of the present invention are directed to enabling incremental and interruptible automatic layout operations (operations that are very time-consuming and resource-intensive) that are conducted between two specific engines called a layout engine and a modeling engine. Each of these engines work in conjunction with each other to provide an automatic layout process for the modeling of a specific electronic design, such as a microchip layout or a motherboard layout.

Embodiments of the present invention further comprise a defined set of interfaces (*e.g.*, of a COM object) between a layout engine and a modeling engine. In one aspect, the modeling engine calls upon these interfaces to start and stop the

layout process, preserve and restore state information, and perform other functions. In another aspect, the layout engine, which may be a pluggable component in the computing environment, raises events through another interface to indicate when the layout engine may be safely interrupted or to indicate progress. Then, the modeling engine can call back into the layout engine to stop the layout if the user has requested that the layout be interrupted. Using these interfaces between the modeling engine and various layout engines, one may interrupt a layout process while preserving and eventually restoring its state, thereby enabling incremental layout operations that do not lose progress. Note that the above description is for example and informational purpose only and should not be used to interpret the claims, which are discussed below.

Claim Rejection under §102

Turning to the claims, amended claim 1 recites a system in a computing device comprising In a computing device, a system comprising a modeling engine for editing modeling elements, the modeling engine connected to a user interface and operable to emulate an electronic system design having a plurality of electronic elements, a layout engine, the layout engine connected to the modeling engine and configured to execute an automatic layout process that automatically lays out modeling elements of the emulated electronic system design, and a set of at least one interface connecting the modeling engine to the layout engine, the set including at least one interface through which the modeling engine communicates with the layout engine to provide user interaction with the automatic layout process other than to cancel the automatic layout process.

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The Office action rejected claim 1 as being anticipated by Lyle. More specifically, the Office action contends that Lyle teaches a modeling engine for editing modeling elements (column 4, lines 54-64 of Lyle) by disclosing an application control manager. Additionally, the Office action contends that Lyle teaches a layout engine (column 10, lines 3-14 of Lyle) by disclosing the transmitting of a prescribed function code to the application control manager to automatically initiate a process. Finally, the Office action contends that Lyle teaches a set of at least one interface connecting the modeling engine to the layout engine (column 10, lines 30-40 of Lyle) by disclosing a pause/end pushbutton for user interaction with the automatic layout process. Applicants respectfully disagree.

Claim 1 has been amended to include the recitation of the modeling engine connected to a user interface and operable to emulate an electronic system design having a plurality of electronic elements. Nowhere in Lyle is there any teaching, much less any cognizance, of electronic elements emulated in an electronic system design.

Furthermore, the term "engine" (sometimes called a back-end processor) is a term widely used in the industry to describe a piece of hardware that encapsulates some function but can't be used without some kind of controller, often called a front-end processor. Thus, a modeling engine, as recited in claim 1, is a particular kind of engine that is designed to perform resource-intensive tasks such as emulating (modeling) microelectronic system designs where model elements behave and interact with each as though they were real as defined by the

parameters stored in the modeling engine. More specifically, as stated in the specification of the present invention at page 16, second paragraph, a modeling engine provides additional support for rendering and editing models beyond that available via a less application-specific rendering engine in a computer system for rendering models. In other words, a modeling engine provides additional capabilities that a typical rendering engine does not natively provide.

For example, four-point hit testing, which is one way to determine whether one model element is above or in close proximity to another model element in a modeling environment, is not natively handled by a typical rendering engine, but is instead provided by a modeling engine. Moreover, in one aspect of the present invention, the modeling engine includes layout-related methods to handle interface with a layout engine component. See pages 16-17 of the specification of the present invention. As such, the term modeling engine is a recognized term of art in the industry and carries specific meaning as recognized by those skilled in this art and its use in the present invention does not deviate from the industry-specific meaning.

In contrast, the cited and applied section (see column 4, lines 54-64) of Lyle merely teaches an application control manager which the Office action contends is similar to and reads upon a modeling engine. These terms are non-analogous as an application control manager is simply a controller or a front-end processor. Specifically, Lyle discloses that the application control manager administers activities of a library of control applications wherein each control application includes a set of instructions for controlling a piece of hardware, such as a pump.

That is, the application control manager in Lyle is front-end processor that may control other processes, but is not intended to handle resource-intensive tasks that a typical engine (back-end processor) is designed for such as emulating electronic elements in an electronic system design. Simply stated, a front-end processor, *i.e.*, an application control manager, cannot be inferred to be an engine, *i.e.*, a back-end processor, let alone a highly specialized kind of engine such as a modeling engine as recited in claim 1.

Moreover, the application control manager in Lyle is called upon to manage any number of smaller applications in a system designed to process and analyze blood samples. Nowhere in the teachings of Lyle can any disclosure be found that mentions or even shows appreciation of the concept of emulating an electronic system design having a plurality of electronic elements as recited in amended claim 1. Lyle is a system directed to an entirely different concept. Not only does Lyle fail to teach a modeling engine, Lyle also fails to teach any kind of system involving the emulation of an electronic system. For at least the foregoing reasons, applicants submit that claim 1 is allowable over the prior art of record.

Applicants respectfully submit that dependent claims 2-10, and 13, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 1 and consequently includes the recitations of independent claim 1. As discussed above, Lyle fails to disclose the recitations of claim 1 and, therefore, these claims are also allowable over the prior art of record. In addition to the recitations of claim 1 noted above, each of these dependent claims includes additional patentable elements.

For example, claim 2 recites that the modeling engine communicates with the layout engine by calls from the layout engine via the interface. As discussed above, Lyle does not teach any engine, let alone a highly-specialized modeling engine and a layout engine operable to emulate an electronic system design. Thus, Lyle cannot possibly teach communication between the modeling engine and the layout engine initiated by a call from the layout engine. Applicants submit that claim 2 is allowable over the prior art of record for at least this additional reason.

In another example, claim 6 recites that the modeling engine communicates with the layout engine to interrupt the automatic layout process. Again, as discussed above, Lyle does not teach any engine, let alone a highly-specialized modeling engine and a layout engine operable to emulate an electronic system design. Thus, Lyle cannot possibly teach communication between the modeling engine and the layout engine wherein an automatic layout process is interrupted. Applicants submit that claim 6 is allowable over the prior art of record for at least this additional reason.

Turning to the next independent clam, amended claim 14 recites a computer-implemented method, comprising starting a layout engine to lay out electronic model elements that are part of an emulated electronic system, receiving information from the layout engine indicating that it can be safely interrupted, and interrupting the layout engine based on the information.

The Office action rejected claim 14 as being anticipated by Lyle. More specifically, the Office action contends that Lyle teaches starting a layout engine to lay out model elements (FIG. 5, item 98 of Lyle) by disclosing a picture of a system

initialization screen shot. Additionally, the Office action contends that Lyle teaches receiving information from the layout engine indicating that it can be safely interrupted, and interrupting the layout engine based on the information (FIG. 9, item 86 of Lyle), by disclosing a touch-screen pushbutton. Applicants respectfully disagree.

The cited and applied section of Lyle is directed to a system for processing and analyzing blood samples and, again, does not teach or even suggest using an engine, let alone using a highly-specialized type of engine called a layout engine that is capable of laying out electronic model elements that are part of an emulated electronic system. Furthermore, Lyle does not teach or even show any appreciation for the concept of receiving information from the layout engine indicating that it can be safely interrupted as recited in claim 14. The cited section of Lyle merely shows a touch-screen pushbutton and is simply a user input interface. Neither the pushbutton itself, nor any other indicator in the system of Lyle is capable of indicating that any process can be safely interrupted. Rather, when the pushbutton in Lyle is activated, the system is simply interrupted without any regard to any information received indicating a safe environment for interruption or otherwise. Thus, Lyle cannot be put forth as a reference that teaches this recitation in claim 14. For at least these reasons, applicants submit that claim 14 is patentable over the prior art of record.

Applicants respectfully submit that dependent claims 15-18, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 14 and consequently includes the recitations of independent claim 14.

As discussed above, Lyle fails to disclose the recitations of claim 14 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 14 noted above, each of these dependent claims includes additional patentable elements.

For example, claim 16 recites receiving a request to interrupt the layout engine, and waiting for the information from the layout engine indicating that it can be safely interrupted. As shown above, Lyle does not teach any engine, let alone a highly-specialized layout engine, and very much less communication to a layout engine to interrupt an automatic layout process only after receiving permission. Lyle merely describes a pushbutton that, once activated, immediately interrupts a process without regard to waiting for permission as recited in claim 16. Applicants submit that claim 16 is allowable for at least this additional reason.

Turning to the last independent claim, amended claim 19 recites a computer-implemented method, comprising starting a layout engine to lay out electronic model elements that are part of an emulated electronic system, providing information to the layout engine by which the layout engine preserves state information, interrupting the layout engine, providing information to the layout engine by which the layout engine restores state from the state information, and restarting the layout engine from the restored state.

The Office action rejected claim 19 as being anticipated by Lyle. More specifically, the Office action contends that Lyle teaches each of the limitations recited in claim 19. Specifically, the Office action contends that Lyle teaches starting a layout engine to lay out model elements (column 10, lines 3-14 of Lyle)

by disclosing the transmitting of a prescribed function code to the application control manager to automatically initiate a process. Additionally, the Office action contends that Lyle teaches providing information to the layout engine by which the layout engine preserves state information (column 4, lines 54-64) by disclosing an application control manager, and interrupting the layout engine, providing information to the layout engine by which the layout engine restores state from the state information, and restarting the layout engine from the restored state (column 10, lines 3-14) by again disclosing the transmitting of a prescribed function code to the application control manager to automatically initiate a process. Applicants respectfully disagree.

As discussed previously, the cited an applied section of Lyle does not teach or event suggest using an engine, let alone using a highly-specialized type of engine called a layout engine that is capable of laying out electronic model elements that are part of an electronic system. Further, the pushbutton process initiation is merely a user input interface. The pushbutton is not capable of providing information about the state of the process. When activated, the system is simply interrupted without any regard to preserving information about the state of the process when interrupted. For at least these reasons, applicants submit that claim 19 is allowable over the prior art of record.

Applicants respectfully submit that dependent claims 20-27 and 29, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 19 and consequently includes the recitations of independent claim 19. As discussed above, Lyle fails to disclose the recitations of claim 19 and

therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 19 noted above, each of these dependent claims includes additional patentable elements.

Claim Rejections under §103

The Office action rejected claims 11 and 12 as being unpatentable over Lyle in view of Wittenberg and rejected claim 28 as being unpatentable over Lyle in view of Hurtado.

Regarding claims and 11 and 12, these claims depend either directly or indirectly from claim 1 and consequently include the recitations of independent claim 1. As discussed above, Lyle fails to disclose the recitations of claim 1 and, therefore, these claims are also allowable over the prior art of record. In addition to the recitations of claim 1 noted above, each of these dependent claims includes additional patentable elements.

For example, with regard to claims 11 and 12, the Office action contends that Lyle fails to teach a system wherein the layout engine comprises a pluggable software component. The Office action goes on further to state that Wittenberg teaches usage and implementation of pluggable software and states that it would have been obvious to an artisan at the time of the invention to include Wittenberg's teachings with Lyle's teachings in order to allow a user to add components that are independent of other components. This is contended for both claims 11 and 12. Applicants respectfully disagree with this conclusion.

Wittenberg may teach a pluggable software component; however, neither Lyle nor Wittenberg teach several recitations of claim 1, the claim from which

claims 11 and 12 depend. Neither Lyle nor Wittenberg, whether considered alone or in any permissible combination, teach a modeling engine, a layout engine, or an automatic layout process. Thus, the combination of Lyle and Wittenberg cannot possibly make obvious the recitations of claims 11 and 12. Applicants submit that claims 11 and 12 are allowable over the prior art of record for at least this additional reason.

Similarly, the Office action rejected claim 28 as being unpatentable over Lyle in view of Hurtado. This claim depends directly from claim 19 and consequently includes the recitations of independent claim 19. As discussed above, Lyle fails to disclose the recitations of claim 19 and, therefore, these claims are also allowable over the prior art of record. In addition to the recitations of claim 19 noted above, this dependent claim includes additional patentable elements.

For example, claim 28 recites that the status information includes data corresponding to time remaining to complete laying out the model elements. The Office action states that Hurtado teaches a method wherein the status information includes data corresponding to time remaining to complete laying out the model elements. The Office action then concludes that it would have been obvious to an artisan at the time of the invention to include Hurtado's teachings with Lyle's teachings in order to allow a user to use time more efficiently. Applicants respectfully disagree with this conclusion.

Hurtado may generally teach a time status indication; however, neither Lyle nor Hurtado, whether considered alone or in any permissible combination, teach several recitations of claim 19, the claim from which claim 28 depends. Neither

Lyle nor Hurtado teach using a modeling engine, a layout engine, or an automatic layout process. Applicants submit that claim 28 is allowable over the prior art of record for at least this additional reason.

For at least these reasons, applicants submit that all the claims are patentable over the prior art of record. Reconsideration and withdrawal of the rejections in the Office action is respectfully requested and early allowance of this application is earnestly solicited.

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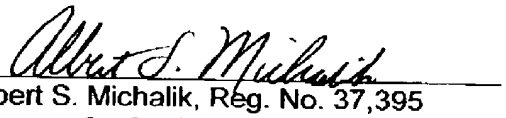
CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 1-29 are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,



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